

HUBBLE SPACE TELESCOPE IMAGE DEBUT

At the Newseum

Remarks for Administrator Bolden

April 23, 2015

AS PREPARED FOR DELIVERY

It's great to be here with all of you. I want to say a special word of thanks to our hosts from the Newseum and to everyone here who is a part of shining light on the magic of Hubble, "the people's telescope."

I was in Colorado last week, and I told the folks with whom I met that this Hubble anniversary is bittersweet for me. It's bitter because 25 years is a long time and I hate to admit I'm that old. It's sweet because of all that Hubble has allowed humanity to see and learn over this past quarter century.

STORY ABOUT HUBBLE LAUNCH

I had the honor of being part of a great crew (that deployed Hubble) and I'll let you in on a little secret: I had the easy job.

I was assigned as the pilot of that mission (NASA speak for co-pilot). Loren Shriver was our Commander and he had the responsibility of maneuvering *Discovery* throughout the deploy evolutions. Dr. Steve Hawley was the one with his hands on the controls of the remote manipulator system (RMS). He was tasked with getting the telescope out of the payload bay of Space Shuttle *Discovery* and released at the appropriate time.

Dr. Kathy Sullivan and Bruce McCandless had been suited up for a possible contingency space walk or EVA when we had some initial problems with the deployment of the Hubble solar arrays.

Hubble is powered by two solar arrays. The first had rolled out of canister smoothly, but the second one gave us problems within seconds of its initial deploy command. Because we needed those arrays to power the telescope itself, getting that second array deployed was critical to the success of the mission.

So over the course of several hours, we got Kathy and Bruce into their space suits, depressurized the airlock and got a "go" to send them out into space to deploy the array manually. A few minutes before we were set to open the airlock hatch – thus exposing them to the shuttle's payload bay and free space – word came back from Houston: "*Hey, time out. Don't open the hatch yet. We've got an idea.*"

Our colleagues at the Goddard Space Center came up with an eleventh hour solution from the ground, and a quarter century later ... the rest is history.

LEGACY OF HUBBLE

During the run-up to the mission, I got the sense that all of us – Loren, Steve, Kathy, Bruce and I – we all sensed that Hubble was going to be something special; but we didn't know how special.

Frankly, we never even thought that the telescope would last this long! The original plan was for Hubble to maybe last 15 years. The fact that we're still going strong a quarter century later is thanks to the "Hubble Heroes" – the scientists, the engineers and the astronauts who flew five missions to service Hubble in space.

Even the most optimistic person to whom you could have spoken back in 1990 couldn't have predicted the degree to which Hubble would re-write our astrophysics and planetary science textbooks.

A quarter century later, Hubble has fundamentally changed human understanding of the universe and our place in it.

Just consider, if you will, a few of the "greatest hits:"

Hubble is mapping out "dark matter" – that invisible matter that makes up most of the mass of the universe;

It first confirmed the presence of black holes in the centers of galaxies;

It made the first observations of the chemical makeup of the atmosphere of a planet orbiting another star;

It's helped scientists determine that the cosmos is 13.8 billion years old;

It's provided the first high-resolution maps of the structures of planet-forming disks of dust and debris around stars like the sun;

Its data has empowered astronomers and other scientists to publish more than 12,800 scientific papers.

Most recently, it taught humanity that the expansion of the universe is speeding up! And that's just the short list!

Every year, Hubble science data processing generates 10 terabytes of new data and discovery – that's enough data to fill the entire collection of the Library of Congress each and every year.

The telescope continues to provide us with the intellectual foundation for future robotic and human expeditions – including our Journey to Mars.

All things considered, I think it's fair to say that Hubble is one of the most influential and important scientific instruments – and achievements – ever devised.

I think that a piece by Traci Watson in USA Today's fantastic special edition about Hubble, sums it up well.

She writes that quote: *"It's likely that no other modern-day scientific instrument has stirred as many passions as the Hubble Space Telescope ... Before Hubble, few of us had any notion of how the cosmos looked. Now we all know ... pinwheels of stars, gauzy pillars of gas and dust, bright galaxies scattered across a dark backdrop"* – end quote.

James Webb Space Telescope

As Frank Sinatra used to sing, *"the best is yet to come."*

Thanks to the last servicing mission in 2009, Hubble is expected to continue to provide valuable data until 2020 and beyond.

With two and a half decades of historic and trailblazing science already accomplished, we've come to realize and expect that there is still much more out there to discover.

Five years ago this week, President Obama laid out a vision for space exploration at the Kennedy Space Center. As a part of his vision, he called for NASA to build on Hubble's legacy with an advanced telescope that will allow us to peer deeper into the universe than ever before.

In 2018, we'll do just that, when we launch the Webb Telescope. It will be placed in orbit about a million miles from Earth, and it will allow us to observe the most distant objects in the universe ... and to see unexplored planets around distant stars. It will shed light on the birth of galaxies and expand our search for undiscovered planets beyond our solar system.

CONCLUSION

I leave you today with some words from Edwin Powell Hubble, the telescope's namesake. He said that, quote *"The history of astronomy is a history of receding horizons."* End quote.

Hubble has played a critical role in shrinking the horizon of our universe. Today we are on the threshold of sending humans farther into our solar system than ever before and thanks to Hubble, our vision is now farther than ever imagined possible.

Happy 25th anniversary Hubble!

A quarter century after we deployed the Hubble Telescope it continues to push outward the horizons of human understanding, progress, and imagination.

It's opened the door for a future where NASA astronauts build large astronomical telescopes in space.

It has transformed the way we understand the Universe, helped us find our place among the stars, and paved the way to incredible advancements in science and technology.